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# JUDGING AND SCORING MILK AND CHEESE

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**FOOD SAFETY AND QUALITY SERVICE**

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# **JUDGING AND SCORING MILK AND CHEESE**

The flavor of milk is the key to its popularity. Only when milk has been properly produced and processed can it be a pleasant and satisfying food.

For this reason, an ability to judge and score milk is an asset to almost everyone involved in producing, processing, or marketing milk.

Judging milk begins at the point of production—on the farm. A farmer needs to know when off flavors or conditions are present in his milk so corrections can be made. Only in this way can quality control, which is the real purpose of all judging and scoring, be maintained.

Judging continues in the commercial dairy plant where the milk is processed. The milk is examined at various points in processing to check for any irregularity in the plant operation. And the finished product is examined by the plant's quality-control specialists, who frequently compare their product with those of competitors.

How does a person learn how to judge and score milk? Training can come from experience in a dairy plant where a variety of milk flavors are found. Or it can come from work with prepared samples. In either case, a basic understanding of the problems involved in judging and a uniform application of judging procedures are very important.

In this connection, high school and collegiate judging contests can be most helpful. These contests not only develop the skills of the individual participants, but, in bringing together students from different localities, also promote uniformity in judging practices.

## **DISTINGUISHING TASTES AND ODORS**

There are four primary taste sensations—sweet, sour, salt, and bitter. Sugar produces the sensation of sweetness; lactic acid or tart apple the sour taste; common salt gives a sensation of saltiness; and quinine produces a bitter reaction. Likewise, there are four fundamental odor sensations—fragrant, sour or acid, burnt, and caprylic or goaty. Because flavor is a combination of taste and odor, the flavors encountered in milk may represent any of the above tastes or odors, either alone or combined.

The taste buds of the tongue vary in their response to the four basic tastes. The sour taste may be noted along the sides of the tongue, salt along the side and tip, sweet generally at the tip, and bitter at the base.

The centers for determining odor are in the uppermost regions of the nasal cavity. For this reason, to get the maximum benefit of the odor part of milk flavor, note its odor by inhaling slowly and deeply before and after you put the sample in your mouth.

In learning to detect flavors, use the following table of these three suggested concentrations for each of the four basic taste sensations. By repeating the taste panel a few times, you can compare your tasting ability with that of others and check your consistency in repeating your previous judgments.

Substance	Grams per—		Percent Concentration
	Quart	Liter	
Sugar .....	6.7	7.0	0.7 (strong)
	2.8	3.0	0.3 (medium)
	.94	1.0	0.1 (weak)
Salt .....	2.8	3.0	0.3 (strong)
	1.9	2.0	0.2 (medium)
	.94	1.0	0.1 (weak)
Lactic acid .....	.47	.5	0.05 (strong)
	.28	.3	0.03 (medium)
	.094	.1	0.01 (weak)
Quinine .....	.094	.1	0.01 (strong)
	.047	.05	0.005 (medium)
	.023	.025	0.0025 (weak)

Note. Weaker or stronger solutions than those suggested above may be desirable as the varying abilities of the individual warrant.

## FACTORS AFFECTING A JUDGE OR GRADER

Most people can develop a good sense of taste and smell, but because many flavors are present in minute concentrations, great skill is often necessary to detect them. In judging dairy products, in addition to developing a keen sense of taste and smell, you should keep yourself in the best of health. Illnesses such as the common cold numb the senses of taste and smell and may jeopardize your ability to distinguish one flavor from another. Even slight changes in health may cause day-to-day variations in ability and thus prevent accurate judgment.

Accuracy in identifying flavors is very important. You should be able to repeat your decisions on the same or similar samples if your judgments are to be accepted. To do this, you should develop good taste "memory" so that you will recognize quickly any previously encountered flavor and its relative intensity. Many times the result of such judgment may mean thousands of dollars in a settlement between the buyer and the seller of a dairy product.

Besides maintaining good health, you should consider certain personal practices. Smoking or using tobacco in any form may cause inconsistencies in judging. The flavor of tobacco may dull the senses of taste and smell, which can make it difficult to detect some of the most delicate tastes and odors. If you do use tobacco, refrain from smoking for at least one hour before judging.

Other possible “distractions” include strong or heavily scented soaps, shaving lotion, hair conditioners, or perfumes. While not always noticeable to the user, these odors are often distracting to other persons. Since foreign odors can cause serious problems in determining otherwise noticeable flavors in milk, scented products should be avoided when judging.

Also avoid eating strong or highly seasoned foods, such as onions or chili, or using chewing gum just before judging dairy products. Eating a heavy meal just prior to judging dulls the senses of taste and smell. These senses are keenest when a person has eaten only lightly or is slightly hungry.

## **JUDGING ROOM AND FACILITIES**

The judging room or area should be clean, orderly, well lighted and ventilated, and free from odors, noises, or other distractions. The temperature should be approximately 72° F.

In student judging contests, however, many people may be crowded together, and some confusion may be unavoidable. For this reason, in training for judging contests it may be advisable to learn to concentrate on detecting flavors under similar conditions.

A waste container with a plastic bag or a sink with running water is necessary in judging. You should not swallow any of the sample. Instead, spit it out as soon as you have determined its taste and odor. Otherwise, you will soon dull your sense of taste and limit your capacity to judge many samples accurately. A separate, disposable cup or container should be used to taste each sample. Glass or china containers may be used if rinsed between samples. A metal cup, unless stainless steel, might impart a metallic flavor. Some paper cups possess a taste or odor of paper. Paper towels are needed for wiping the hands and mouth.

## **JUDGING MILK**

### **Description and Causes of Off Flavors**

Flavors of milk may be caused, in general, by five factors: Health of the cow, feeds consumed by the cow, bacteriological action, chemical changes, and absorption of foreign flavors after the milk is drawn.

Although extensive research has been done to determine the specific causes of common flavors in milk, still more work remains before specific causes can be definitely reported for all flavors. A number of off flavors, together with their probable causes, are listed below. By understanding their origin, you will have a better background for identifying and recognizing each of these particular flavors.

**Bitter.** A bitter taste in fresh milk may be caused by (1) strong feeds or weeds which may carry through into the milk, or (2) conditions present in milk from cows in late lactation, e.g., stripper cows just before the drying-up period. Bitter taste may also result from certain bacterial growth, but normally this will not occur unless the milk is held several days at low temperatures. Bitter milk is sometimes confused with rancid milk. Remember that bitterness is only detected by taste and not by smell.

**Cooked.** This flavor results from heating milk. It may appear when all or part of the milk has been heated too high or too long. Normally, the higher the heating temperature, the more intense the cooked flavor.

**Feed.** The feed a cow eats may impart certain flavors to milk. Some stronger feeds will carry through more noticeably than others. Green grass, silage, turnips, and alfalfa hay are outstanding examples. Feed flavor can be minimized or eliminated by taking the cows off offending feeds at least 4 hours before milking. Certain feeds can be detected in milk if fed to the cow even 15 to 30 minutes before milking.

**Flat (watery).** The source of this uncommon flavor is difficult to determine. The flavor may be described as tasteless. The characteristic flavor of normal milk is lacking, but the milk has no off-flavor. Flat-flavored milk resembles normal milk that has been partially diluted with water, even though this may not have been done.

**Foreign.** Any seriously objectionable flavor foreign to milk, such as fly spray, paint, oil, kerosene, creosote, or a medicinal substance, will render the milk unpalatable or unfit for use. Such a flavor may either directly contaminate the milk or be absorbed. Sanitizers are included in this flavor category. The residue of sanitizers, such as hypochlorite and iodophor, if left on dairy equipment, may be absorbed by milk and impart a foreign flavor. Phenolic compounds used in udder ointments may combine with iodophor or hypochlorite to form a highly objectionable foreign flavor which is detectable in a very low concentration.

**Garlic/Onion.** This obnoxious weed flavor, imparted to milk when the cow eats garlic, onions, or leeks, is not classified as one of the usual feed flavors described above. The garlic/onion flavor is recognized by the distinctive taste and odor suggestive of its name. It may actually be so objectionable as to render the milk undesirable for use.

**High Acid.** Milk that has developed some acidity as a result of bacterial growth (generally *Streptococcus lactis*) will have a detectable acid flavor long before it may be classified as sour. Milk may have an acid flavor when only a small part of high acid milk is mixed with milk of lower acidity; yet the total acidity on the entire lot may be within normal range.

**Malty.** This is not a common flavor but may be encountered in milk not properly cooled. Certain bacteria from improperly cleaned equipment, especially milking machines, may contaminate the milk and cause the objectionable malty flavor.

**Metallic.** Metallic flavor is rough and puckery on the mouth and tongue. It is caused when milk comes into contact with corrodible metal, such as exposed copper on equipment or rusty milk cans or lids. It is very objectionable and may lead to further serious defects in certain dairy products, such as butter, when held in storage. The intensity of the metallic flavor may increase in proportion to the extent of the milk's contact with metal.

**Musty.** This flavor is suggestive of musty or moldy hay. It may be absorbed directly by the milk but is more likely to come from feed or stagnant water consumed by the cow.

**Oxidized.** This flavor, quite pungent in advanced stages, is definitely objectionable. The oxidized flavor embraces many other flavors which represent various stages of oxidation or partial changes in the fatty portion of milk. "Papery" or cardboard, sunlight, and tallowy are forms of oxidized flavors with varying degrees of intensity. This is one of the most troublesome milk flavors and should be easily recognized. It develops when milk placed in a glass or plastic container is left in the sun for a short time or for a longer time under artificial light in a store cabinet. Contact with copper or iron also contributes to this flavor.

**Rancid.** This flavor, resembling the flavor of stale fat, is not encountered in its extreme form in fresh milk. A taste noticeable in fresh milk is sometimes referred to as "lipase" flavor, which is induced by the enzyme lipase. This enzyme causes a change in the composition of the milk fat. "Lipase" is closely associated with bitter flavor; but unlike the common bitter flavor, it has an odor resembling spoiled nut meats. It is more noticeable either during winter, when cows are on dry feed, or during late lactation. Extreme agitation of warm raw milk in the presence of air, causing foaming, will result in a rancid type flavor within a few hours.

**Salty.** Salty taste, which may be present in milk from cows in the late stages of lactation, is often characteristic of milk from cows infected with mastitis. It is not commonly found in herd milk or mixed milk received at a dairy plant. This defect cannot be detected by odor.

**Unclean.** The unclean flavor is seldom found except in pasteurized milk that has been stored too long or at a slightly high refrigerator temperature. Unclean flavor often accompanies the bitter flavor. It may be caused by growth of bacteria in milk or from contact of milk with decomposed material on improperly washed or sanitized equipment or utensils.

**Weedy.** The weedy flavor is not included among the usual feed flavors. It generally has a bitter characteristic, varying with specific weeds of certain localities. It may include obnoxious flavors caused by such plants as ragweed, bitterweed, or peppergrass, and may become a very troublesome flavor defect. It can be eliminated or minimized by keeping cows away from weed-infested pastures or by not offering feeds containing such weeds until after the cow is milked.



## Preparing Samples of Characteristic Milk Flavors

In gaining experience judging milk, you may not be able to observe a variety of samples at the same time. Therefore, methods of preparing special samples are listed below. Intensities may be adjusted by diluting the sample with high-quality pasteurized milk.

Samples shall be prepared from pasteurized milk intended for table use and tempered at 60° F.

**Bitter.** Add a small amount of quinine sulfate.

**Cooked.** Heat the milk to near boiling.

**Feed.** Place silage and water in a flask and connect a tube to a one-hole rubber stopper placed in the top of the flask. Place the end of the tube into a second flask, containing milk. Heat the water-silage mixture to boiling, allowing the gases to bubble through the milk. The milk will quickly absorb the gases. Use this milk as a stock solution to flavor homogenized milk.

**Flat.** Add water (distilled, if available).

**Foreign.** Add chlorine or a similar sanitizing solution having a distinctive flavor.

**Garlic/Onion.** Add garlic salt or a few drops of juice from an onion, or put a piece of onion in the milk for a short time.

**High Acid.** Add a small amount of cultured buttermilk.

**Malty.** Add malt flavor or soak the milk in a Grapenuts type of cereal, strain or filter, and dilute with milk.

**Musty.** Use the same procedure used to prepare the feed flavor, but substitute musty hay for silage.

**Oxidized.** Add one drop of one-percent solution of copper sulfate per quart of milk and place the sample in the sun, or leave a copper penny in a sample of milk for a few hours.

**Rancid.** True rancidity is best produced by adding about ten-percent raw milk to homogenized milk and warming the mixture to about body temperature, then refrigerating it overnight. Early in practice you may wish to intensify this flavor by adding two drops of butyric acid per pint of milk.

**Salty.** Add common salt.

**Unclean.** This flavor is difficult to reproduce. It can best be obtained by refrigerating several samples of pasteurized milk and selecting samples with somewhat putrid odor and bitter taste. Add this milk to good-quality milk to produce the unclean flavor at a lower intensity.

**Weedy.** This flavor, too, may be difficult to duplicate, but a similar flavor may be obtained by mixing feed-flavored milk and bitter milk.

## Examining the Sample

Samples are best judged or scored with only number identification; knowing the brand or source of the sample may prejudice the judge.

Before attempting to score milk samples for the first time, you should work with a trained judge or coach and learn to recognize and identify the various flavors you may encounter.

This is the usual procedure for identifying a flavor:

1. Put a warmed sample (60° F.) of milk into a glass or cup. If possible, before the sample is poured, quickly note the odor from the bottle or container; otherwise the odor may soon be lost. Also, immediately after pouring the sample, determine its odor.

2. Take a small sip, and with the mouth closed, not swallowing any of the milk, move your tongue moderately five or six times to assure that the rear of the tongue also comes into contact with the sample. At the same time, inhale and exhale slowly through the nose. This forces the aroma through the back of the nose, making it possible to note the aroma.

3. Spit out the sample quickly and identify the aftertaste. Hold the sample in your mouth no longer than about ten seconds. Holding it longer will dull your senses of taste and smell.

4. If necessary, repeat the procedure as a further check on your findings. Sometimes it may be necessary to go on to the next sample and come back later for a recheck. However, in order to avoid confusion and develop more confidence in your decision, do not recheck samples any more than is necessary.

It is advisable to allow a short interval of time between tasting samples, especially after tasting the more harsh and objectionable flavors. This interval will allow your saliva to refreshen your mouth. Sometimes rinsing your mouth with water helps, but this usually is not necessary.

After a few trials under the leadership of a capable coach or judge, you can begin to recognize typical flavors and consider their intensities and ratings. From then on, you need continued practice in examining many samples in order to become a well trained judge.

## **Determining the Flavor (Taste and Odor)**

Consumer acceptance of milk depends largely on a pleasing flavor. Before tasting a milk sample, you should note the odor or aroma. Smell the open container of milk, rather than the individual cup, since the greater volume in the bottle makes it easier to detect the odor. In contests, of course, it may not be possible for each contestant to follow this procedure.

Frequently, odor alone is sufficient to classify milk properly. Tasting then only further substantiates the flavor found by the aroma. (Flavors, however, that are not volatile may be detected only by taste.) Odor plays a very important part in quality determination at a dairy-receiving platform. Therefore, individual cans or transport tanks of milk are opened and the aroma is noted before the cans or tanks are emptied. Similarly, when milk is examined in a bulk tank at the farm, odor is quickly noted when the lid of the tank is first raised.

Because flavors become more volatile at higher temperatures, warm samples carefully to about 60°F. prior to examination. A cold sample (below 45° F.) chills your mouth and makes it difficult for you to distinguish certain flavors.

The "ideal" natural flavor of milk should be firmly fixed in mind for comparison. The mental image will help in distinguishing between samples which show varying characteristics and types of flavor. Each sample should be scored on its own merits in comparison with the "ideal." However, you should guard against being too critical, because you may imagine flavors that are not there. Depend on your own judgment, and do not let the comments or facial expressions of others influence you.

Certain feed flavors are usually present and, if only slight, should not be seriously criticized. Most of them can be easily detected, and nearly all can be prevented. For that reason, they should be identified and corrected as soon as possible by the producer.

Some feeds containing weeds, or feeds imparting strong flavors, such as silage, are undesirable. Flavors from such feeds should be scored according to intensity. Wild onion and other weeds are highly objectionable flavors and will render any lot of milk unsuitable for drinking or for any dairy product of high quality. Fresh grass during early spring and summer may cause a milk flavor which is scored down.

Objectionable flavors, such as metallic, oxidized, and rancid, can be readily recognized and are scored according to intensity. Other flavors, such as chemicals or fly sprays and sanitizers, are highly objectionable and should be quickly recognized.

In learning to determine flavor, you should study the description of flavors and their causes outlined above.

## **Using the Scorecard**

There are various standards or methods for measuring milk quality. A scorecard was one of the earliest forms used for evaluating and recording quality.

The scorecard for judging milk used in the Future Farmers of America (FFA) contests appears on p. 17. On the scorecard, a total of 40 points is allotted to flavor. Not all of the flavors that may be found are listed, since in FFA contests participants are required to know only those flavors listed in the current FFA Bulletin No. 4. If a sample reveals more than one flavor, the additional flavor(s) may be noted, but usually only the flavor carrying the lowest rating is recorded and scored.

In judging the flavor of milk using the FFA scorecard, the following scoring system should be used. Although 40 points are allotted to flavor, no sample is scored below 31.

Score	Quality	Defects
40	Excellent	No defect
38–39	Good	Slight cooked, slight feed, flat
35–37	Fair	Slight bitter, slight malty, slight metallic, slight musty, slight oxidized, slight unclean, slight weedy, cooked, feed, or salty
32–34	Poor	Slight foreign, bitter, high acid, garlic/onion, malty, metallic, musty, oxidized, rancid, unclean, weedy, strong cooked, or strong feed
31	Unacceptable	Foreign, strong garlic/onion, strong high acid, strong metallic, strong musty, strong oxidized, strong rancid, or strong weedy

## JUDGING COTTAGE CHEESE

### Description and Causes of Off Flavors

Only those flavors of cottage cheese which do not pertain to milk are described below. For the other flavors, consult the previous section on judging milk.

**Acid.** A strong, tart acid flavor is caused by bacteria used in manufacturing cottage cheese. This is a clean flavor that should be rather mild and not unpleasant.

**Coarse.** Too much diacetyl causes a coarse flavor. This compound itself is an essential part of the normal flavor of cottage cheese. Diacetyl is produced by bacteria or by adding a concentrated flavor ingredient to the cheese or to the cream dressing. However, too high a concentration makes the cheese taste somewhat bitter and similar to the flavor of English walnuts.

**Fermented/Fruity.** This flavor resembles vinegar, pineapple, or other fruit. Bacteria and yeasts are primarily responsible for development of this off flavor, which is easily detected by smell. The flavor is strongly criticized.

**High Salt.** A small amount of salt is added to the creaming mixture to bring out its desirable flavor. The salt taste should not be more noticeable than the flavor of the creaming mixture.

**Lacks Freshness.** This flavor is usually the forerunner of more serious off flavors produced by microorganisms, by absorption of odors, or by chemical reactions such as oxidation. The fresh delicate flavor of desirable cottage cheese is missing.

**Musty/Yeasty.** These flavors are grouped together because molds and yeasts grow under the same conditions and are particularly adapted to growth in the acid environment provided by cottage cheese. The true musty defect is best detected by an odor which resembles the odor of a poorly ventilated cellar or damp

basement room. The yeasty defect is similar to the flavor of bakers' yeast or of yeast-leavened bread. Other types of flavors may be produced by yeasts and molds. Many of these yeasts and molds break down the fats and proteins of cottage cheese, and thus give rise to the defects rancid and unclean.

## **Preparing Samples of Characteristic Flavors of Cottage Cheese**

To prepare specific flavors, drain the cream from the cottage cheese or use dry curd cheese. Add milk which has been prepared to contain a rather high intensity of the particular off flavor and stir it into the sample. Drain off any excess milk.

**Coarse.** Add diacetyl to the milk.

**Fermented/Fruity.** Add vinegar and pineapple juice to the milk.

**Lacks Freshness.** Refrigerate the cottage cheese for several days. If a pronounced unclean flavor develops, add milk to the defective cheese, then drain it off and add it to a sample of good cheese in a quantity which will mask the fresh flavor but will not impart a distinctively unclean flavor.

**Musty/Yeasty.** To reproduce the yeasty flavor add dry yeast to the milk. Reproduction of the musty flavor of cottage cheese is the same as that of the musty flavor of milk, described on p. 7.

## **Examining the Samples**

Samples at about 50° F. are usually displayed in 1- to 10-pound containers. The cheese should have been stirred just prior to examination to distribute cream over the surfaces of the cheese curds. Cream often contains much of the flavor of cottage cheese. Only the small curd variety is used in FFA contests. Paper plates and spoons are used in sampling cottage cheese. It may be helpful to rinse your mouth with water between samples.

Judges should first observe the odor of the cheese in the container, then observe the flavor of the cream dressing before chewing the curd, which releases flavor from the interior.

Since many of the flavor characteristics of cottage cheese are like those of milk, only a few additional flavors need to be learned. Flavors of cottage cheese which seldom occur in milk are: Coarse (diacetyl flavor), fermented/fruity, lacks freshness, and musty/yeasty. Both milk and cottage cheese are quite susceptible to spoilage by microorganisms. They must be stored refrigerated, preferably at 34 to 40° F., and be protected from contamination.

## Using the Scorecard

The FFA scorecard allots 40 points to the flavor of cottage cheese. As with milk, cottage cheese samples are not scored below 31 points. The scoring system is as follows.

Score	Quality	Detects
40	Excellent	No defects
38–39	Good	Slight acid, coarse, flat, or high salt
35–37	Fair	Slight bitter, slight malty, acid, or lacks freshness
32–34	Poor	Slight musty/yeasty, slight rancid, bitter, fermented/fruity, foreign, garlic/onion, malty, metallic, oxidized, or unclean
31	Unacceptable	Musty/yeasty, rancid, strong bitter, strong fermented/fruity, strong foreign, strong garlic/onion, strong malty, strong metallic, strong oxidized, or strong unclean

## JUDGING MILKING MACHINE PARTS

For many years, educational groups and sanitarians have realized the importance of milking machine units as a source of contamination. FFA was the first organization to incorporate a scoring system for milking units into their contests. FFA developed a scoring guide and scorecard for the evaluation of the condition and cleanliness of rubber and metal parts. The FFA program is doing much to point out the importance of sanitary equipment to farmers and dairy workers.

In the FFA scorecard for judging milking machine parts, a 10-point system is used. One point is subtracted for each of the defects listed below. A combination of defects can reduce a score to zero.

Rubber parts—dirty or milkstone  
Rubber parts—checked or blistered  
Rubber parts—absorbed fat (weak/sticky)  
Rubber parts—leaky  
Rubber parts—poorly fitted  
Metal parts—dirty or milkstone  
Metal parts—badly dented or damaged  
Metal parts—pitted or corroded  
Metal parts—open seam  
Metal parts—milk exposed to copper or brass

Milker units are scored as a unit and are not to be handled. They may represent bucket type or pipeline milkers. Normal score is 5 through 9 points.

# JUDGING SEDIMENT

Sediment in bottled milk is uncommon, but varying amounts may be noted in bulk milk as it is received by the milk plant.

Sediment may enter milk from improperly cleaned cows, from the milking environment (especially when milking machines are allowed to suck in air during application to the cow), and from improperly cleaned equipment.

The sediment content of milk is scored on the FFA scorecard by using the charts shown in figures 1, 2, and 3. Figures 2 and 3 are the charts most commonly used by industry and regulatory officials for checking raw milk quality. These charts are published as separate U.S. Sediment Standards for Milk and Milk Products. (7 CFR 58 Subpart T.)

For milk in cans, one pint of milk is taken from the bottom of an unstirred can by the use of the special sediment tester. The sample is forced through a 1¼-inch-diameter filter disc, which is made especially for the purpose and fitted into a specially constructed sediment tester. The disc is then compared with the standard discs in figure 1 or 2 and the relative score allotted to the sample. Using figure 1, the discs showing 0.0 mg. of sediment are scored 10; 0.10 mg., 9; 0.20 mg., 8; 0.30 mg., 7; 0.50 mg., 5; 1.0 mg., 4; 2.5 mg., 1; and in excess of 2.50 mg., 0. Samples are scored only by whole points, according to comparison with the standard disc.

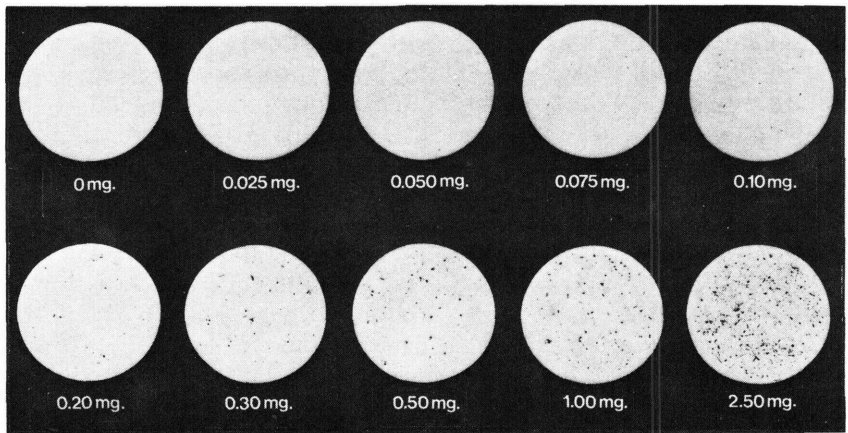


FIG. 1

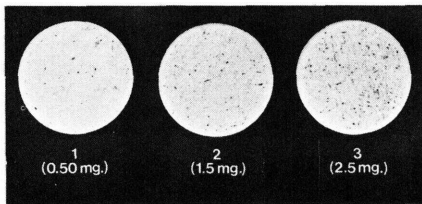


FIG. 2

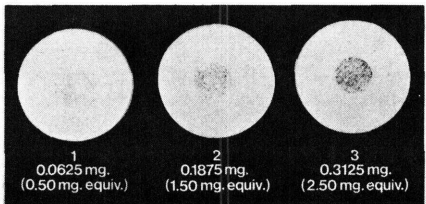


FIG. 3

Using the charts in figure 2, the discs are scored as follows: 0. mg., 10; more than 0. mg., but not more than 0.5 mg., 5; more than 0.5 mg. but not more than 1.5 mg., 3; more than 1.5 mg. but not more than 2.5 mg., 1; more than 2.5 mg., 0.

For bulk milk in farm tanks, a pint sample is taken of well-mixed milk in the tank and run through a special sediment tester fitted with a small orifice 0.4 inch in diameter. The disc is then compared with the photographs of USDA Standards shown in figure 3. The following system of scoring is used in the FFA contest: 0 mg. sediment, 8; more than 0.0 mg. but not more than 0.5 mg. equivalent, 6; more than 0.5 mg. equivalent but not more than 1.5 mg. equivalent, 4; more than 1.5 mg. equivalent but not more than 2.5 mg. equivalent, 2; more than 2.5 mg. equivalent, 0. Score whole points only.

## IDENTIFICATION OF CHEESE

Of the following 14 cheese varieties, 10 are selected for identification as part of the FFA contest.

**Blue.** This blue-vein mold ripened variety is usually made from cow's milk. It has a tangy, peppery flavor after aging 2 to 6 months. The body and texture is semisoft, pasty, and sometimes crumbly. Blue cheese has a white interior and is marbled or streaked with blue veins of mold.

**Brick.** This semisoft ripened variety is made from cow's milk. It has a mild to moderately sharp flavor after aging 2 to 4 months. The body and texture is semisoft to medium firm, elastic, and has numerous small mechanical openings. Brick cheese is a creamy yellow.

**Brie.** This soft ripened variety is usually made from cow's milk. It has mild to pungent flavor after aging 4 to 8 weeks. The body and texture is soft and smooth when ripened. Brie cheese has a creamy yellow interior with an edible thin, brown and white crust.

**Cheddar (mild).** This firm ripened variety is made from cow's milk. It has a mild to slightly developed characteristic nut-like Cheddar flavor after aging usually for 2 to 3 months. The body and texture is firm and smooth with some mechanical openings. Cheddar cheese is white to medium-yellow orange.

**Cheddar (sharp).** This firm ripened variety is made from cow's milk. It has a sharp typically nut-like Cheddar flavor after aging usually 8 to 12 months. The body and texture is smooth and waxy with some mechanical openings. Cheddar cheese is white to medium-yellow orange.

**Colby.** This firm ripened variety is made from cow's milk. It has a mild to mellow flavor after aging 1 to 3 months. The body and texture is softer and more open than Cheddar cheese. It is characterized by numerous irregularly shaped openings. Colby cheese is white to medium-yellow orange.



**Cream.** This soft unripened variety is made from cream from cow's milk. It has a mild, acid flavor and is not aged. The body and texture is soft and smooth. Cream cheese is white to light cream.

**Gouda.** This firm ripened variety is made from whole or partly skimmed cow's milk. It has a mellow, nut-like flavor after aging 2 to 6 months. The body and texture is semisoft to firm, smooth, and has small irregularly shaped or round holes. Gouda has a creamy yellow or medium-yellow orange interior, and may or may not have a red wax coating. It has a cannonball or oval shape.

**Monterey (Jack).** This firm ripened variety is made from cow's milk. It has a mild to mellow flavor after aging 1 to 3 months. The body and texture is soft to semisoft and has small openings evenly dispersed throughout the cheese. Monterey is white to light cream.

**Mozzarella.** This firm, unripened variety is made from whole or partly skimmed cow's milk. It has a mild delicate flavor and is not aged. The body and texture is slightly firm and is plastic. Mozzarella is creamy white.

**Munster.** This semisoft, ripened variety is made from cow's milk. It has a mild to mellow flavor after aging 1 to 8 weeks. The body and texture is semisoft and has small openings throughout the cheese. Munster has a creamy white interior with a yellow tan surface.

**Provolone.** This firm ripened variety is made from cow's milk. It has a mellow to sharp flavor with smoky and salty overtones after aging 2 to 12 months or longer. The body and texture is firm and smooth. Provolone has a light creamy interior with a light brown or golden yellow surface.

**Ricotta.** This soft, unripened variety is made from whole or partly skimmed cow's milk, or whey from cow's milk with whole or skim milk added. It has a sweet, nut-like flavor and is not aged. The body and texture is soft and may have a grainy consistency. Ricotta is white.

**Swiss.** This firm ripened variety is made from cow's milk. It has a sweet, nut-like flavor after aging 3 to 9 months. The body and texture is firm and smooth with medium to large round eyes distributed throughout the cheese. Swiss is light yellow.

Care should be taken that only representative samples of these varieties are selected. Special attention should be given to selecting Brick and Munster samples so that they will not be confusing to the students.

A score of 2 points is given for each variety incorrectly identified.

# MILK QUALITY AND DAIRY FOODS CONTEST

Form 3

Contestant Name \_\_\_\_\_ Contestant No. \_\_\_\_\_

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted or the cheese variety observed and in proper sample column. Do NOT write in space indicating official score, grade difference and grade on defects.

PERFECT SCORE	DEFECTS	SAMPLE NUMBER										TOTAL GRADES
		1	2	3	4	5	6	7	8	9	10	
<b>MILK FLAVOR</b>	Contestant's score	36	40									
	Official score	32	38									
No Defects	Grade difference	4	2									6
40 Points	Grade on defects	2	0									2
(Defects	Bitter	0										
valued at 1	Cooked											
point each)	Feed											
Range 31-40	Flat-watery	X										
	Foreign											
	Garlic or onion											
	High acid											
	Malty											
	Metallic											
	Oxidized											
	Musty											
	Rancid											
	Salty											
	Unclean											
	Weedy											
	No defect		XO									
<b>MILK SEDIMENT</b>	Contestant's score	4	8									
8 Points	Official score	6	6									
	Grade difference	2	2									4
	Varieties	1	2	3	4	5	6	7	8	9	10	
	Grade on Identification*	2	0									2
<b>IDENTIFI- CATION OF CHEESES</b>	1. Blue											
	2. Brick											
	3. Brie	X										
	4. Cheddar (mild)	0										
	5. Cheddar (sharp)											
	6. Colby											
	7. Cream											
	8. Gouda											
	9. Monterey (Jack)											
	10. Mozzarella		XO									
	11. Munster											
	12. Ricotta											
	13. Provolone											
	14. Swiss											
<b>TEST SCORE</b>	Test on milk production (Number wrong)											6
<b>CONTESTANT'S SCORE — PART I</b>												20

Example: As an aid to a better understanding of the scoring method used, two samples are scored and identified on the card above: X-indicates Contestant's check; O-indicates official's check.

# MILK QUALITY AND DAIRY FOODS CONTEST

Form 4

Contestant Name \_\_\_\_\_ Contestant No. \_\_\_\_\_

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted and in proper sample column. Do NOT write in space indicating official score, grade difference, grade on defects, rubber parts and metal parts.

PERFECT	SAMPLE NUMBER										TOTAL		
SCORE	DEFECTS	1	2	3	4	5	6	7	8	9	10	GRADES	
SCORING COTTAGE CHEESE	Contestant's score	37	35										
	Official score	34	36										
	Grade difference	3	1									4	
	Grade on defects	0	2									2	
FLAVOR	Acid												
	Bitter	X	O										
	No defects												
	40 Points												
	(Defects valued at 1 point each)	Fermented/Fruity		X									
		Flat											
		Foreign											
		Garlic/onion											
	Range 31-40	Lacks Freshness											
		Malty											
		Metallic											
		Oxidized											
		Musty/yeasty		O									
		Rancid											
		Salty											
		Unclean											
No defect													
MILKER UNIT	Contestant's score	6	8										
	Official score	7	8										
	Grade difference	1	0									1	
	Grade on defects	3	0									3	
	(Defects valued at 1 point each)	Rubber parts -											
		dirty or milkstone	X	O									
		checked or blistered		X	O								
		absorbed fat (weak sticky)											
		leaky	X										
		poorly fitted	O										
		Metal parts											
		dirty or milkstone	X										
		badly dented or damaged		X	O								
		pitted or corroded											
		open seams	X	O									
		milk exposed to copper or brass											
TEST SCORE		Test on milk marketing	(Number wrong)										5

Example: As an aid to a better understanding of the scoring method used, two samples are scored on the card above: X-indicates contestant's check; O-indicates official's check.

## SUMMARY

Briefly, the principal points to observe in judging are these:

1. Be in good physical and mental condition. Avoid strong flavored foods and eating a heavy meal just before judging. Do not use strong perfumed soap or lotions.
2. Select a satisfactory room or area for judging. Have milk samples adjusted to 60° F. and cottage cheese samples to 50° F.
3. Know the scorecard and ratings of each item.
4. Learn the classification of each defect and the evaluation of its intensity.
5. Detect the aroma as soon as possible.
6. Take into the mouth a sufficient sample for proper tasting, exhaling slowly through the nose to observe the volatile flavors.
7. Concentrate on the taste and odor sensations and make your mental comparisons with the "ideal" and with the scorecard.
8. Avoid being too critical; do not try to find flavors that may not be present or that you imagine might be present.
9. Record the score and allow sufficient time for the mouth to become refreshed before taking the next sample.
10. Depend on your own judgment. Avoid being influenced by facial expressions or comments of others. They may be misleading.
11. Do not become discouraged; diligent practice and a lot of experience are essential to develop good judging ability. There are no short cuts.

